Abstract

A direct frequency synthesizer provides an output signal derived from a high frequency reference signal that is frequency divided and mixed to satisfy the coarse step synthesis requirements of an offset loop synthesizer. The absence of a VCO within the direct frequency synthesizer, provides the direct frequency synthesizer with lower phase noise than a typical PLL-based coarse step synthesizer. Though applicable to a variety of types of synthesizers and signal generators, the direct frequency synthesizer provides especially advantageous noise performance when used to generate an offset signal for an offset loop synthesizer of the first local oscillator of a spectrum analyzer, where the second local oscillator of the spectrum analyzer provides the reference signal for the direct frequency synthesizer.